

**REMARKS/ARGUMENTS****Provisional Claim Rejections Under Obviousness-Type Double Patenting.**

The examiner is thanked for thoroughly reviewing the subject patent application and Applicant's arguments, filed 11/28/05, in response to the previous Office Action. The Examiner continues to provisionally reject claims 1 and 3 of the subject application: "under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 17, 21, 23, 29 and 30 of copending Application No. 10/872,915". As indicated in the above amendment to the specification of the subject application, that copending application has now issued as US Patent No. 6,979,586. Applicants are somewhat confused by the referenced copending claims, however, since, in a previously filed office action response to the now-issued patent, claims 21 and 23 were cancelled. Applicants will, therefore, assume that claims 1 and 3 of the subject application are considered to be unpatentable over claims 17, 29 and 30 of that copending application, which conflicting claims are now the patented claims 1, 9 and 10 of the issued patent.

Examiner continues to press his argument that: "Although the conflicting claims are not identical, they are not patentably distinct from each other because they both disclose a method for forming MTJ memory structure comprising providing a substrate, forming a multilayered magnetic tunneling junction structure on the magnetic layer further comprising forming a seed layer on the substrate, forming antiferromagnetic layer on the seed layer, forming a synthetic antiferromagnetic pinned layer on the

antiferromagnetic layer, forming a tunneling barrier layer, forming ferromagnetic layer on the tunneling barrier layer, forming ferromagnetic free layer, forming capping layer, annealing multilayer MTJ structure, producing a magnetic anisotropy in ferromagnetic free layer and patterning multilayered MTJ structure to create circular/elliptical cross sectional shape.” What the preceding recitation fails to include however is the novel step of forming a top antiferromagnetic layer on the ferromagnetic free layer and then annealing the cell to exchange couple the top antiferromagnetic layer to the ferromagnetic free layer to provide a uni-axial magnetic anisotropy. The formation of this top antiferromagnetic layer and its exchange coupling to the ferromagnetic free layer is recited in claim 1 of the subject application but it is not an element of conflicting claim 1 of the issued patent. The top antiferromagnetic layer maintains the ferromagnetic free layer of the present claimed invention in a state of uni-axial magnetic anisotropy. The ferromagnetic free layer of conflicting claim 1 of the issued patent is not maintained in a state of uni-axial anisotropy by any element that is formed within the cell structure. Rather, its magnetic anisotropy is provided by an external, composite bit line that is not a part of the cell structure. If that bit line is not present, the cell is magnetically isotropic. Whereas, in the subject application, the cell is magnetically anisotropic whether or not a bit line is present. Thus, the subject application describes and claims a cell with a built-in, inherent magnetic anisotropy, while the cell of the supposedly conflicting claim is not inherently magnetically anisotropic, but requires an external bit line structure to render it magnetically anisotropic. Indeed the cell claimed in claim 1 of the issued patent is specifically shaped as circular or elliptical with low aspect ratio to eliminate the possibility of a shape-induced magnetic anisotropy and the free layer is not annealed to

provide it with a crystalline anisotropy. The only annealing process recited in claim 1 of the issued patent is the anneal to pin the pinned layer of the cell. This is not the same as the anneal to exchange couple the top antiferromagnetic layer to the free layer that provides uni-axial anisotropy to the free layer in claim 1 of the subject application. In sum, the cell of the issued patent is inherently magnetically isotropic whereas the cell of the subject application is inherently uni-axially anisotropic. Applicants would respectfully argue that these differences are patentably distinct, that the subject application and the issued patent describe two entirely different cell structures, and that there is no conflict between the claims. Applicants, therefore, would respectfully submit that claims 1 and 3 of the subject application should not be rejected under the statutory doctrine of double patenting over the now issued patent US 6,979,586. Applicants would also respectfully suggest that the remaining claims 2, and 4-14, which are objected to, are also allowable as depending from allowable claims.

### **Conclusion**

The Examiner is thanked for thoroughly reviewing the application. All claims discussed above are now believed to be allowable. If the Examiner has any questions regarding the above application, please call the undersigned attorney at 845-452-5863

Respectfully submitted,



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